TOP FY 2000
Project Narrative

Lane Council of Governments

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1. PROJECT PURPOSE

a. Problem – The Oregon motto for 9-1-1 is "*When seconds count*", yet in Lane County, Oregon, those with the job of dispatching emergency services have major obstacles to achieving rapid response and deployment. Just getting the cry for help isn't enough. Emergency responders must be able to quickly determine:

- where they are going and how to get there the quickest, safest way
- enough information about the emergency to analyze the situation

The people of our county depend on 9-1-1 dispatch services to bring them fire, medical, and law enforcement services, often in an emergency. They trust that once they have called 9-1-1, help is on the way. The reality is that excellent dispatch services in Lane County aren't enough. "First response" emergency personnel use a huge map book to figure out where they are going. Sometimes, if they are lucky, another volunteer has hand drawn landmarks onto the map. If responders are lost and out of radio range, they lose precious moments trying to figure out where they are and where they are going, while their neighbors lose precious moments away from life saving equipment or their homes burn to the ground.

Three major barriers stand between 9-1-1 dispatch and citizens needing emergency services – county **geography** coupled with a navigational system which consists of huge paper map books, a **volunteer-based rural emergency response system**, and an **outdated mapping technology** all leave citizens and emergency staff vulnerable.

(1) Geography – Lane County has a population of 301,900 in a geographic area of 4,610 square miles – roughly the size of Connecticut. It stretches almost 100 miles from the summit of the Cascade Mountains down into the Willamette and McKenzie River valleys, across the Coastal Mountain range, and down to the Pacific Ocean (Map, Appendix I). According to the Department of Transportation, we have 2,731 miles of county, city, and state roads to traverse. More than half our residents live in the county's two largest cities, Eugene and Springfield, on opposite sides of Intestate 5 which runs about 50 miles north/south in the middle of Lane County. The rest of the residents live in the other 11 incorporated cities within our borders and in unincorporated areas along river valleys and up mountain hollows.

In a county this size, response time is always a major issue. Under the best of circumstances, estimated response time to the edges of ambulance services areas is 45 minutes (map, Appendix I). Once dispatch gets through to emergency staff, responders often don't know where they are going. The site frequently is not some nice, neat home address on an easily located street. Many residences do not even have house indicators. Even if responders find a row of mailboxes, they may spend many minutes up the wrong driveway or taking a wrong fork on one of Lane County's many gravel roads while someone is suffering a heart attack. Large expanses of national and state forests, remote farms and homesteads, gravel roads which seem to go on forever and may lead to a dead end all make sites potentially hard to find. In addition, Lane County's land mass is divided with ribbons of rivers and creeks with bridges frequently far apart. Some can bear the weight of heavy fire trucks, water trucks, and ambulances, and some cannot. With flooding a common problem, bridges in rural areas are frequently under water when emergency response is most critical. Emergency responders currently carry a huge map book in their emergency units. Not only are they difficult to read, they do not provide important information such as how to get

to the address location.

(2) Volunteers – Like many counties with small cities and large rural areas, many of the jurisdictions depend on volunteers to staff their fire departments. Volunteers are an invaluable part of the emergency service delivery system, but property tax limitations in Oregon have resulted in a forced dependence on volunteers at the same time that public expectations have risen for rapid, effective response from an increasingly complex emergency system. Volunteers are not paid to be located onsite at the firehouse. They drive from their homes or workplaces, often in the middle of the night, to operate a rescue unit or a very large piece of fire apparatus carrying 1000 gallons of water, the pump to apply this water, and all the other equipment necessary for fire suppression. They must have proper routing directions to these emergency calls. Driving to the wrong location may contribute to the loss of life or shelter.

(3) Outdated Mapping Technology – We are fortunate, through the cooperative efforts of regional government agencies (including Lane Council of Governments, Lane County, the cities of Eugene and Springfield, and the Eugene Water & Electric Board), to have a computerized Regional Lane Information Database (RLID), which can be accessed on the Internet. This data warehouse of land information could be very helpful to emergency responders. In addition, in the late 1980's, LCOG, under contract with Central Lane Public Safety Answering Point (CLPSAP – 9 -1-1 dispatch) created a number of Geographic Information System (GIS) layers to create a set of Fire Run maps for the CLPSAP area. These layers include rural fire provider boundaries, railroad lines, water features, and other critical information. Three major barriers stand between this great asset and the emergency responders who need it:

- Road centerline data capable of supporting emergency routing are not available for most of the County.
- The regional site address data are maintained as a point file that is not associated with a road centerline file. The address points may or may not represent where dwellings are actually located and are of little value for responders who need to get from the road to the house.
- Responders don't have an effective way to access this data.

b. Solution – Responders need to determine at once exactly where they are going and the best and quickest way to get there. Emergency and law enforcement personnel need as much information as possible to help them analyze the situation. To achieve these goals, the **Lane County *Right Route Project*** will increase effectiveness and efficiency of "first responders" by:

- Providing accurate rural locating information to responders.
- Instantly telling responders the quickest, safest route to get there.
- Ensuring the closest personnel to an emergency are dispatched.

To meet these goals, we will:

1.Develop a pilot project in Western Lane County to equip two law enforcement agencies, seven fire protection districts, and two ambulance districts with:

- Ø Mobile, rugged, computers with CD-ROM drives and GPS units mounted in key vehicles.
- Ø Compact Discs updated monthly which will provide digital maps.
- Ø Software that locates an emergency destination (from a specified address) and response vehicle location (from GPS coordinates) and determines the response route in mapped and text direction formats.
- Ø Layered theme maps for additional information such as locations of known hazards, water sources, multiple dwellings, railroads, airports, bridges, and other available data of

interest to the respective responders.

2.Update the RLID system with:

- Ø Road center lines
- Ø Minimal road centerline attributes such as road names/numbers
- Ø Rural address road access points within the project area
- Ø Latitude/longitude coordinates

Outcomes for the ***Right Route Project*** are included in the description of the evaluation in Section 7 of this application.

3. INNOVATION

A similar system to the one we are proposing was developed by the City of Winston-Salem Integrated Network Fire Operations and funded by TOP (called TIIAP at that time). The innovation in our project is to make a similar system work in a geographically large area with diverse terrain including large expanses of wilderness separating small and large communities of people. We will meet this challenge by utilizing the volunteer organizations, who are the ultimate end users of this information resource, to help map the road center lines and rural address access points and gather other pertinent data from their respective jurisdictions to suit their needs. They have agreed to provide their time free of charge because they believe the ***Right Route Project*** will increase their ability to be successful emergency responders. The coordination and centralized warehousing of this regional information for the public safety entities of Lane County will vastly improve the service delivery to all residents in these areas. Also, these data will now be available for other planning agencies of Lane County for future projects related to both public safety and transportation planning.

Currently, mutual aid agreements exist among emergency service organizations throughout the county. This effort will reinforce the importance of these agreements and also provide the tools to allow agencies to respond to their neighbor's district as needed and have the proper directions to the emergency scene.

In addition, a new opportunity is on the horizon which will provide 9-1-1 dispatch centers the ability to give exact locations to responders regardless of the remoteness of the site. The Federal Communications Commission, through Phase II Wireless Enhanced 9-1-1, is requiring all commercial wireless carriers to update their systems so 9-1-1 dispatchers will be able to identify the latitude and longitude of locations cell phone calls originate from. Currently, calls from phones which are hard-wired already provide address location. This improvement in technology will make ***Right Route*** even more valuable and effective.

4. DIFFUSION POTENTIAL

a. Aspects That Enable Replication by Other Communities

(1) Prevalence of Problem – Unfortunately, our geography, volunteer-based emergency systems, and outdated technology coupled with an abundance of isolated communities and "black holes" in the communications grid are not unique to rural Lane County. Most of the land mass of the United States is rural with scattered communities.

(2) Improvements Upon Existing Approaches – Many of the solutions to finding hard-to-locate sites during an emergency work best in cities. Technology is more apt to be current. Radio communication actually works consistently. Commercial wireless services are readily available and options exist for linking computers in vehicles with dispatch centers where technology is

located. Our solution will work in rural communities with rugged terrain and large expanses where wireless communication is non-existent – communities where, once you are on the road, you may be in a communication vacuum.

(3) Cost Effectiveness vs. Other Alternatives – Paper map books are clearly cheaper, but given their inefficiency when lives, shelter, and property are on the line, cost is not the most important consideration. For accurate, computerized mapping with reliable, online graphic representations and the ability to tell where the vehicle is relative to where it is going, this is a cost effective solution. Once the database is developed and the mapping system in place, the main cost is purchase of rugged computers to be installed in key response vehicles – approximately $3,000, including installation – and GPS units, costing approximately $699 each. Providing a CD-ROM will cost about $5 monthly. The software to be able to view and use the maps costs $1,195 per user. To put these costs into perspective, compare them to one major destructive fire raging unchecked with loss of life and property.

(4) Aspects That Make Solution Accessible to Other Communities – Most communities have some level of digital land based information, such as tax lots, already in databases. Many communities are in the process of trying to integrate their various digital information, including their geographic, land-based information, for a range of uses. As technology makes access to this information more common and user-friendly, our use of that data for life saving emergency response will be appealing and accessible to other communities.

b. Plans to Ensure Lessons Learned are Distributed – We will present information on the ***Right Route Project*** in various local, statewide, regional, and national venues. LCOG GIS staff are active in the Urban and Regional Information System Association. They are making a presentation to the regional association this April. The regional and national association meetings always have public safety tracks. If this project is funded, our staff will ask to present information on this project at the regional and national level. In addition, ESRI, the vendor for ArcView and other mapping software, has the largest GIS conference in the world in San Diego each year which draws approximately 8,000 people. This would also make an excellent forum for information on ***Right Route***.

Both LCOG and RLID have web sites where information will be posted. On the RLID site, by this summer some portion of the data base will be posted for free public access. Once developed, the centerline information could be posted for a range of public uses.

5. PROJECT FEASIBILITY

a. Technical Approach – Our rationale in choosing this technical approach is to provide state-of-the-art information to assist emergency responders despite critical barriers:

- The mountains, valleys, and hollows in Lane County result is many “dead spots” in the communications system. For this reason, voice-based solutions or information transferred to computers over radio frequencies are not feasible at this point.
- Commercial wireless service is not available in much of rural Lane County.

At the same time, RLID has an enormous amount of information and capacity which, if responders had access to it, would greatly assist them in getting to emergencies more rapidly. By utilizing GPS units which are linked into a port on a laptop with a CD-ROM of mapping and locating information which is updated monthly, responders will be able to do the following:

- Use GPS to find their current location
- Alert dispatch to their location so dispatch can deploy the closest unit

- Use their location and the coordinates provided to them by dispatch (including addresses, landmarks, mile markers, etc.), the digital maps on CD-ROM, and routing software to display the quickest workable route to the exact location
- Use the map layers to analyze variables such as the closest water for fire trucks, hazardous materials in the area, etc.

(1) Interoperability – The software used on the laptops will be the same mapping software (ArcView) used by LCOG for this and other mapping activities or other related user-friendly software which is interoperable. It will use GIS and other data files directly from RLID, facilitating the regular maintenance and update of the map data drawn directly from RLID.

(2) Technical Alternatives – As part of the planning for this project, our end-user group analyzed the feasibility of including wireless data communications as part of this project. We determined that planning is underway on this communications issue, but the planning has not evolved to the point that there is agreement among all the partners on many critical issues. The mapping project can provide a technological resource now to improve ability to respond to emergencies and other critical situations and still be useable once the communications and networking systems are improved.

(3) Scalability – Once wireless technologies are expanded to rural Lane County, we will upgrade our system by linking the computers installed in vehicles using wireless modems and data communications links to dispatch so mapping information can be obtained from a network, real-time. This improved technology will also allow for Automatic Vehicle Locating and other technological advances to be expanded outside our urban core. Furthermore, this project is a pilot in Western Lane County. Once it is completed and refined in that part of the county, other fire departments and law enforcement agencies will be sought as partners and the project will be expanded to other rural areas to provide eventual countywide coverage.

(4) Maintenance and Upgrading – RLID is supported by on an ongoing basis by a Cooperative Project Agreement of five partners – LCOG, Lane County, Eugene, Springfield, and Eugene Water and Electric Board. The addition of new partners – Eugene and Springfield Emergency Medical Response, seven rural fire department, Florence Police Department, and the Lane County Sheriff's Office – to add information not currently in the system potentially will increase the ability to keep information such as road centerline data up to date and useable. Also, when Phase II Enhanced 9-1-1 is available, we will already have mapping with latitude and longitude coordinates already in place and accessible.

b. <u>Qualifications of the Applicant Team</u> – Lane Council of Governments (LCOG) is the lead agent for this application. LCOG is a local government entity under Oregon law, created in 1945 to meet the needs of member local government jurisdictions for a range of professional and technical support and consulting services. These services include providing the staff support for the Public Safety Coordinating Council, a 31 member council (24 agency heads and managers and seven citizen members) to plan and implement a comprehensive community safety and justice system.

The Principal Planner through LCOG for PSCC is Myra Wall (Resumes, Appendix II), lead staff for LCOG's Community Safety unit. She will be the Project Director. Myra has 25 years' experience as a corrections professional ranging from Jail management to corrections training to strategic planning. For the past three years, she has provided the lead staff support to guide the PSCC and its member agencies' many collaborative efforts. She is also the Project Director for the ChildLink and Risk Assessment Program projects currently funded by TOP (then TIIAP).

ChildLink is designed to reduce child abuse and fatalities by developing a data warehouse to identify families in crisis to provide help to the family and protection to the child. RAP is creating a virtual case management system shared between pretrial release, adult corrections, and parole and probation.

LCOG's Information Services provide tools and technical expertise to assist jurisdictions with various information services needs. A list of some of LCOG's data processing and data access projects are included in Appendix III. LCOG's GIS staff maintain a comprehensive collection of regional land information (RLID), produce maps for a variety of needs, and coordinate regional GIS-related interagency committees and projects.

c. <u>Budget, Implementation Schedule, and Timeline</u>

(1) Budget – The budget for this project is $486,523 ($236,301 federal, $250,222 match) for year one and $113,772 ($57,463 federal, $56,310 match) for year two. It is described in detail in the attached budget narrative. Letters of commitment from all key partners are included in Appendix IV. Match for all partners and for LCOG as lead agent is outlined in the Statement of Matching Funds. Match is provided by:

- Ø Volunteers from rural fire departments, assisting in collection of road centerline data and rural address access points for residences and businesses in Western Lane County
- Ø Lane County, collecting centerline data on County maintained roads
- Ø ESRI, allowing us to waive our licensing fee for ArcView software and purchase only five packages while installing the program on all 31 computers we are installing in vehicles
- Ø LCOG, providing part of our Principal Planner's time to serve as project manager and supervisor as well as liaison between partners and the PSCC
- Ø LCOG, providing part of our Senior Researcher/Evaluator's time to oversee the evaluation program including design, implementation, and monitoring

(2) Implementation Schedule – ***Right Route*** will be completed in two years, three phases:

<u>Phase I</u>

- · Develop the centerline file for roads and rural address access points to residences and businesses
- · Work with partners to assign attributes such as road names/numbers to the file
- · Design of a process to maintain the file

<u>Phase II</u>

- · Design and test a pilot in a small unincorporated area

<u>Phase III</u>

- · Complete design and implement for rest of Western Lane County
- · Evaluate system
- · Refine system
- · Develop plan and timeline to add the remainder of Lane County to the system

(3) Timeline – The project will be completed in two years. Most of year 1 will involve design and development (Phase I) with field testing (Phase II) occurring at the end of year 1. During Year 2, the project will be implemented throughout Western Lane County (Phase III), evaluated, and refined. If the project proves effective, a plan and timeline will be developed to add the rest of Lane County to the database. A workplan is included in Appendix V.

d. <u>Sustainability</u> – Once completed, this project will require some ongoing support to

sustain it. Road center lines and other layers can be kept up to date with help from the new regional players from the public safety community who will assist with ongoing maintenance of rural address access points.

5. COMMUNITY INVOLVEMENT

a. Partners – Partners in this project are LCOG, Lane County Sheriff's Office, Florence Police, Springfield Fire and Life Safety, Eugene Fire and Medical Emergency Services, Junction City Fire Department, Lake Creek Rural Fire Protection District, Lane Rural Fire and Rescue, Lane County Fire District #1, Mapleton Fire District, Siuslaw Rural Fire Protection District, Swisshome Deadwood Rural Fire Protection District, and Western Lane Public Safety Answering Point. LCOG will serve as lead agent, managing the project, facilitating planning and design efforts, and providing technical information system and geographic information system expertise. The match discussed under Budget above and in the Statement of Matching Funds shows the commitment of these agencies in seeing this project come to fruition. In addition, the provider of ArcView software to be used in the emergency response vehicles, ESRI, is allowing us to waive the usual licensing requirements and only license five of 31 software packages. These key partners were involved in design of the project and, if the grant is awarded, will continue as an end user team, refining the workplan, identifying attributes for the files, and other key design issues as the project evolves. They will also complete surveys and provide feedback as part of the evaluation to assist in determining if the project is achieving its outcomes and what refinements need to be made.

b. Community Involvement – The larger community will be a recipient of better services as a result of this project. Most of us never worry about emergency services until we or a loved one need them. Nonetheless, rural fire departments are staffed in large part by average community members who play above average roles in our communities, volunteering to fight fires and provide emergency services in addition to the rest of their roles in the community. Projects involving these players are high in community involvement by nature.

c. Support for End Users – End users, as described under "Partners" above and in the workplan in Appendix V, were involved in the planning and will be involved in all aspects of further project design, development, and evaluation to ensure the system meets their needs, skills, and working conditions. End users are most of the partners identified above.

6. REDUCING DISPARITIES

a. Description and Documentation of the Disparities

(1) Geography – As outlined above, Lane County is roughly the geographic size of Connecticut. Like many Pacific Northwest counties, it is urban/rural in nature. Much disparity exists between urban and rural areas. Rural communities are isolated with clusters of people many miles apart. Mountains, valley, and rivers further divide people from essential services, including law enforcement and emergency services. This terrain also creates "black holes" in the communications net. Law enforcement, volunteer firefighters, and other emergency responders are often simply not reachable because they have unwittingly stepped across an invisible line – physical barriers prohibit them from being in range of radios, cell phones, or other means of communication.

(2) Poverty – Over the past 15 years, the timber industry in Lane County has been hit hard

economically. The lack of sufficient timber, combined with increasing public concerns for the health of the ecosystem, has resulted in a loss of family wage jobs and a traditional way of life. In the urban core of Eugene/Springfield, high technology industry is beginning to fill the gap with such giants as Sony and Hyundai building facilities and providing jobs. Rural communities, however, heavily dependent on timber and frequently single-industry towns, have been much slower to recover. This economic disparity has decimated the tax base of these small communities. As a result, the contrast and disparity between urban and rural areas is growing. In the urban core of Eugene/Springfield, where 58% of the population lives, fire suppression services are provided by paid, full time firefighters under the auspices of relatively well funded city governments. Throughout rural Lane County where the other 42% live, fire suppression services are provided largely by volunteers. In Western Lane County alone, 286 community member volunteer as fire fighters. In Lane County as a whole, this number soars to 696. These volunteers literally hold the lives of their friends and neighbors in their hands.

(3) Technology – In recent years, rural/urban disparity has been further exacerbated by the digital divide. As with law enforcement, fire departments, and emergency medical services in most cities in American, the emergency responder vehicles in the two large cities all have onboard computers. Due to the terrain, city responders are also never out of reach of radio communications. Cellular phone and data carriers abound.

In contrast, in the small cities and unincorporated areas of rural Lane County, few vehicles have computers on board. Simple radio communication is operational one minute and non-existent the next, particularly once staff step outside their vehicles. Few if any commercial wireless carriers provide services, and then only over an extremely limited range. None of the rural responders are even close to having any way to receive information over a computer mounted in their vehicles yet.

b. <u>Strategies for Overcoming Barriers to Access</u> – Our strategy for overcoming barriers is to develop a pilot project in the most populous isolated area of our county to provide:

- Rugged, onboard computers in all first response vehicles
- ArcView map viewing software
- CD-ROM's, updated monthly, with graphic display of locations tied to latitude/longitude coordinates and road centerline files
- GPS units in all first response vehicles, connected to computers

As a result, in an emergency, the following scenario will take place:

1. Dispatch will call or page an emergency responder.
2. The responder will be told the emergency and a location and coordinates.
3. The responder will enter the coordinates. The GPS unit will tell the computer program where the responder is and chart the quickest, safest route from the responder's current location to the destination and graphically display it for the responder.
4. Once on the road, the GPS unit will track the movement of responders and whether they are on the right track. They can also alert dispatch to their anticipated arrival time.
5. The map layers will show both the dispatcher and the responder where the closest water is located, which bridges will bear their weight, where hazards are located which could require further preparation, caution, and evacuation, etc.
6. Even when responders are out of radio and cell phone range, they will be able to tell where they need to go and whether they are getting there.

In the near future, as wireless communication becomes more available throughout the county, the

mapping system will be readily adapted for online mobile access. The onboard system will have been tested, and minimal steps will be required for responders equipped with computers to be able to access the most up to date, layered information real time. In addition, Western Lane County will already be partially equipped to take advantage of other opportunities which require computers mounted in vehicles.

7. EVALUATION AND DOCUMENTATION

a. Evaluation Questions – Key questions are does the ***Right Route Project***:

- Ø Increase the ability of emergency, rescue, and fire departments and law enforcement agencies to get to the correct location in as short amount of time as possible?
- Ø Reduce risks to responding units and the public?
- Ø Provide information in a timely manner to "first-response officials" and assist agencies in on-the-spot immediate analysis?
- Ø Provide information online, graphically represented, to scale?
- Ø Provide enhanced information such as location of water sources and bridges able to carry heavy emergency vehicles?

b. Evaluation Strategy –

Outcomes	Indicators	Methods
Emergency responders will get to the correct location in a short amount of time	Perception of responders	Pre/Post survey of volunteers, staff
Risks to responding units, public will be reduced	Perception of responders	Pre/Post survey of volunteers, staff
Information is provided in a timely manner and assist agencies in immediate analysis	Information is available online, useful, usable by volunteers and staff	Site visits Pre/Post survey of volunteers, staff
Information is provided online, graphically represented, to scale	End product	Quality review of end product
Enhanced information is available online	End product	Quality review of end product

c. Data Collection – Data will be collected using the methods outlined above.

d. Data Analysis – The Researcher/Evaluator will compile information from surveys, site visits, and product review and analyze them. The Researcher/Evaluator will prepare periodic evaluation reports and provide them to the project partners and the Public Safety Coordinating Council. Evaluation information will be used to refine the project as it proceeds.

e. Evaluators – The survey will be designed and conducted by the LCOG Community Safety Senior Researcher and Evaluator. The Project Coordinator will conduct site visits and review the project components in the field. The Researcher and Evaluator will review project components as they are developed and when completed to assist in ensuring product quality.

f. Budgeting of Resources and Staffing for Evaluation – The Researcher/Evaluator is a new permanent LCOG Community Safety staff position. The hiring process for this position is currently underway. This person's time will be provided as match by LCOG.